Problem List

Your Name Goes Here	**1.3** {3,4}	H/T: Last Names
Math 387 Analysis I	**1.4** {1,2}	Spring 2017
Homework 3	**2.1** {1,5,9}	Due: Thursday, February 9

Unassigned, but suggested: Problems 5,7 in Section 1.3
Unassigned, but suggested: Problem 6 in Section 1.4
Unassigned, but suggested: Problems 6, 10, 15 in Section 2.1

3.1 Problem 1.3.3

Find a number M such that $|x^3 - x^2 + 8x| \leq M$ for all $-2 \leq x \leq 10$.

Solution. □

3.2 Problem 1.3.4

Finish the proof of Proposition 1.3.7. That is, prove that given any set D, and two bounded functions $f\colon D \to \mathbb{R}$ and $g\colon D \to \mathbb{R}$ such that $f(x) \leq g(x)$ for all $x \in D$, then

$$\inf_{x \in D} f(x) \leq \inf_{x \in D} g(x).$$

Solution. □

3.3 Problem 1.4.1

For $a < b$, construct an explicit bijection from $(a, b]$ to $(0, 1]$.

Solution. □

3.4 Problem 1.4.2

Suppose $f\colon [0, 1] \to (0, 1)$ is a bijection. Using f, construct a bijection from $[-1, 1]$ to $\mathbb{R}$.

Solution. □

3.5 Problem 2.1.1

Is the sequence $\{3n\}$ bounded? Prove or disprove.

Solution. □

3.6 Problem 2.1.5

Is the sequence $\left\{\dfrac{n}{n+1}\right\}$ convergent? If so, what is the limit?

Solution. □

3.7 Problem 2.1.9

Show that the sequence $\left\{\dfrac{1}{\sqrt[3]{n}}\right\}$ is monotone, bounded, and use Theorem 2.1.10 to find the limit.

Solution. □